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10/066,115	02/01/2002	Peter Jivan Shah	020103	6021

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Qualcomm Incorporated  
Patents Department  
5775 Morehouse Drive  
San Diego, CA 92121-1714

EXAMINER
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LE, DUY K

ART UNIT	PAPER NUMBER
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2685

DATE MAILED: 08/04/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Application No.

10/066,115

Applicant(s)

SHAH, PETER JIVAN

Examiner

Duy K Le

Art Unit

2685

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1-46 is/are pending in the application.
- 4a) Of the above claim(s) 14-21, 28-30 and 42-46 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-13, 22-27 and 31-41 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

## Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

## Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date 5.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_.

**DETAILED ACTION**

***Election/Restrictions***

1. Restriction to one of the following inventions is required under 35 U.S.C. 121:
  - I. Claims 1-13, 22-27, and 31-41, drawn to a distortion reduction circuit in a receiver, classified in class 455, subclass 295, 296.
  - II. Claims 14-21, 28-30, and 42-46, drawn to an automatic calibration circuit with built-in signal generator, classified in class 455, subclass 226.1.
2. Inventions I and II are unrelated. Inventions are unrelated if it can be shown that they are not disclosed as capable of use together and they have different modes of operation, different functions, or different effects (MPEP § 806.04, MPEP § 808.01). In the instant case the different inventions are distinct, each from the other because of the following reasons: Invention I has utility such as a distortion reduction circuit in a receiver and Invention II has utility such as an automatic calibration circuit with built-in signal generator.
3. Because these inventions are distinct for the reasons given above and the search required for Group I is not required for Group II, restriction for examination purposes as indicated is proper.
4. During a telephone conversation with Attorney George C. Pappas on 7/1/2004, a provisional election was made without traverse to prosecute the invention of Shah, claims 1-13, 22-27, and 31-41. Affirmation of this election must be made by applicant in replying to this Office action. Claims 14-21, 28-30, and 42-46 are withdrawn from further consideration by the examiner, 37 CFR 1.142(b), as being drawn to a non-elected invention.

***Claim Rejections - 35 USC § 102***

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

6. Claims 1-13, 22-27, and 31-41 are rejected under 35 U.S.C. 102(e) as being anticipated by Faulkner (U.S. Patent 6,606,484).

As to claim 1, Figure 1 in Faulkner shows a distortion reduction circuit (5) for a device having a receiver (3, 8) (see Col. 3, lines 52-67), the circuit comprising:

a gain stage (6, 7) having an input coupled to the receiver and an output, the gain stage controlling an amplitude of an output signal related to a second order nonlinear response within the receiver (see Col. 3, lines 43-67); and

an output coupling circuit (10 or S) to couple the gain stage output to the receiver (see Col. 4, lines 1-19).

As to claim 2, Figure 1 in Faulkner shows the circuit of claim 1, wherein the gain stage controls the amplitude of the output signal based on the amplitude of the second order nonlinear response within the receiver (see Col. 3, lines 43-62).

As to claims 3, 23, 32, and 39, Figure 1 in Faulkner shows the circuit and method, further comprising a squaring circuit (6) coupled to the receiver to generate the signal related to the second order nonlinear response within the receiver (see Col. 3, lines 56-62).

As to claims 4 and 38, Figure 1 in Faulkner shows the circuit of claim 1 and the method of claim 37, wherein the receiver is a radio frequency (RF) receiver (see Col. 3, lines 13-18).

As to claims 5, 11, 25, and 33, Figure 1 in Faulkner illustrates the circuit, device, and method, for use with the receiver generating a down-converted signal wherein the output coupling circuit is a adder having first and second inputs and an output (see Col. 4, lines 1-19 and Col. 5, lines 22-36. It is inherent that subtractor 10 or S can be implemented as an adder with  $x$  having a gain of  $g_2$  to equal  $-k_2$  (versus a subtractor with  $x$  having a gain of  $g_2$  to equal  $k_2$ )), the first input configured to receive the down-converted signal from the receiver and the second input configured to receive the gain stage output signal (see Col. 4, lines 1-19).

As to claims 6, 12, and 34, Figure 1 in Faulkner shows the circuit, device, and method, for use with the receiver having a mixer (3) wherein the mixer generates the signal related to the second order nonlinear response within the receiver wherein the gain stage is coupled to an input node of the mixer (see Col. 3, lines 63-67).

As to claim 7, Figure 1 in Faulkner shows the circuit of claim 1, wherein the gain stage generates an output current having a current amplitude related to the second order nonlinear response within the receiver (see Col. 3, lines 59-62 and Col. 5, lines 16-36).

As to claim 8, Figure 1 in Faulkner shows the circuit of claim 7, for use with the RF receiver generating a down-converted signal wherein the output coupling circuit is a direct connection of the down-converted signal of the receiver (see Col. 3, lines 13-24 and 63-67).

As to claims 9, 13, 26, 27, 35, 36, and 41, Figure 1 in Faulkner shows the circuit, device, and method, for use in factory calibration of a wireless communication device containing the receiver (see Col. 1, lines 28-42. It is inherent that the direct conversion receiver 1 is used in a

wireless communication device, e.g., for receiving RF signal in a TDMA system) wherein the receiver generates a down-converted signal (see Col. 3, lines 13-24), the receiver being configured to receive an external input signal to permit adjustment of the gain stage to thereby minimize the second order nonlinear response of the down-converted signal (see Col. 4, lines 20-32, Col. 5, lines 49-62, and Col. 6, lines 10-34).

As to claim 10, Figure 1 in Faulkner shows a wireless communication device including a receiver and a distortion reduction circuit (see Col. 1, lines 28-42. It is inherent that the direct conversion receiver 1 is used in a wireless communication device, e.g., for receiving RF signal in a TDMA system), the device comprising:

a gain stage (6, 7) having an input coupled to the receiver and an output, the gain stage controlling an amplitude of an output signal related to a second order nonlinear response within the receiver (see Col. 3, lines 43-67); and

an output coupling circuit (10 or S) to couple the gain stage output to the receiver (see Col. 4, lines 1-19).

As to claim 22, Figure 1 in Faulkner shows a distortion reduction circuit (5) for a device having a receiver (3, 8) (see Col. 3, lines 52-67), comprising:

amplitude control means (6, 7) for controlling an amplitude of a signal related to a second order nonlinear response within the receiver (see Col. 3, lines 43-67); and

coupling means (10 or S) for coupling the signal to the receiver to reduce the second order nonlinear response of the receiver (see Col. 4, lines 1-19).

As to claims 24 and 40, Figure 1 in Faulkner shows the circuit of claim 22 and method of claim 37, for use with a receiver having a mixer (3) wherein the mixer generates the signal

related to the second order nonlinear response within the receiver, the amplitude control means being coupled to an input of the mixer (see Col. 3, lines 63-67).

As to claim 31, what is cited in claim 22 for a distortion reduction circuit is applicable for this claim. Figure 1 in Faulkner illustrates a method for distortion reduction for a device having a receiver, comprising:

controlling an amplitude of a signal related to a second order nonlinear response within the receiver (see Col. 3, lines 43-67); and

coupling the signal to the receiver to reduce the second order nonlinear response of the receiver (see Col. 4, lines 1-19).

As to claim 37, Figure 1 in Faulkner illustrates a method for distortion reduction in a wireless communication device having a receiver (see Col. 1, lines 28-42. It is inherent that the direct conversion receiver 1 is used in a wireless communication device, e.g., for receiving RF signal in a TDMA system), comprising:

controlling an amplitude of a signal related to a second order nonlinear response within the receiver (see Col. 3, lines 43-67); and

coupling the signal to the receiver to reduce the second order nonlinear response of the receiver (see Col. 4, lines 1-19).

### ***Conclusion***

7. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

- a. Gentzler (U.S. Patent 6,191,652) discloses amplifier distortion correction using cross-modulation.
  - b. Kawai (U.S. Patent 6,072,997) discloses frequency discriminator for a direct conversion receiver.
  - c. Ly (U.S. Patent 6,545,487) discloses system and method for producing an amplified signal with reduced distortion.
8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Duy K Le whose telephone number is 703-305-5660. The examiner can normally be reached on 8:30 am - 5:00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Edward F Urban can be reached on 703-305-4385. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Duy Le  
July 19, 2004

  
EDWARD F. URBAN  
SUPERVISORY PATENT EXAMINER  
TECHNOLOGY CENTER 2600